

PATENT SPECIFICATION

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COMPLETE SPECIFICATION.

Delivery Mechanism for use in Printing Machines.

We, R. HOE & Co. LIMITED, a company organised under the laws of Great Britain, of 109, Borough Road, London, S.E. 1, do hereby declare the nature of this invention (which has been communicated to us by R. Hoe & Co. Inc., a company organised and existing under the laws of the State of New York, of 504, Grand Street, City, County and State of New York, United States of America,) and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

15 This invention relates to improvements in delivery mechanism for use in printing machines.

In printing products from web printing machines, the character of the product frequently requires the simultaneous printing and delivery of a large number of differently printed folded signatures, and in some instances products in which the signature is delivered with a "head" fold, that is, a fold, which in the finished product is at the top of the page, this head fold being produced by running the web over a former, this folding of the product having certain advantages.

30 The object of the present invention is to provide apparatus so arranged that there may be used a large number of deliveries for simultaneously delivering a large number of different printed products, the apparatus being compact and accessible and not unduly complicated nor requiring many parts.

In carrying out this invention this is effected by providing two, three or more formers, as desired, which are arranged out of line with each other widthwise and lengthwise of the press, and by making the folder and the cutting mechanism two, three or more products wide.

45 The products are then delivered to delivery devices such as trays on each side of the folder and cutting mechanism, these delivery devices being superposed and each device being capacitated to receive two, three or more products delivered abreast. Thus with this arrangement the number of signatures which can be handled may be greatly increased

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without the addition of a large number of parts, and by so arranging the formers the width of the folder can be increased to the width of the number of products it is required to handle without losing compactness and accessibility.

In a modification the formers are arranged out of line widthwise only of the press, the formers being, however, directed in the same direction.

The invention is illustrated in the accompanying drawings in which Figure 1 is a diagrammatic side elevation of a press and delivery embodying the novel features of the invention; Figure 2 is a plan view of the arrangement shown in Figure 1; Figure 3 is an end view of the folder used with the arrangement of figure 1; figure 4 is a partial plan view of a modified folder arrangement; figure 5 is a diagrammatic side elevation of a modified arrangement of the formers, and figure 6 is a plan view of the arrangement shown in figure 5.

Referring now to these drawings, the machine which has been chosen to illustrate the invention is a perfecting web press which is fed from a web roll marked 1, the web being indicated by the letter W, the printing and perfecting couples of this press being marked 2, 3 and supported in suitable framing 2' and inked from suitable inking mechanism 3'.

In the particular arrangement shown, the machine is capacitated to print on a web six pages wide, though, of course, the width of the web and the number of pages may be varied within any desired limits.

After the web has been printed, referring first to the construction of figures 1 to 3, the web is led over a drag roller 4 where it is slit into 6 webs, *a, b, c, d, e, f*, by a splitter, indicated by the numeral 4'. After the web has been slit, three of the webs, as the webs *b, d, and f* are led directly to and over three drag rolls 5, 6 and 7; the other three webs *a, c, and e*, each go over a pair of turning bars 8—8' and then are associated with the other webs and pass with them over the drag rolls 5, 6 and 7.

In the embodiment of the invention illustrated, these webs are given a head

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fold by means of formers, one former being supplied for each web or each set of associated webs. While these formers may be varied in number, in the particular machine illustrated, there are three such formers, and these formers are arranged out of line widthwise of the machine, that is widthwise of the web so that each web or set of associated webs have web paths of different lengths, the difference being slightly more than the width of a product. While this out of line position of the formers may assume various arrangements, in the construction shown in figures 1 to 4, the formers are arranged in staggered offset relation to each other, that is, they are arranged diagonally of the run of the web through the machine or arranged out of line both widthwise and lengthwise of the machine, these formers being marked (in figure 2) 9, 10 and 11, the formers being of the ordinary V-type.

After the webs have received their head fold they pass through nipping rolls 12, 13 and 14, arranged below the formers and to and between a centrally arranged pair of nipping rollers 15. From the rollers 15 the webs are directed to and through a pair of cutting cylinders 16 having cutting knives 16', 16". These cutting cylinders are of the width of the number of products corresponding to the number of formers, that is, in the present instance, these cutting cylinders are three products wide, so that all the webs or associated webs may go to the cutting mechanism side by side. After the products have been separated from the webs by the cutting cylinders they are drawn through a pair of nipping rollers 17 and pass to a pair of folding cylinders 18, 19.

In the machine embodying the invention in its best form, the products are delivered on each side of the folding mechanism. In accordance with the invention, therefore, these folding cylinders 18, 19 are arranged alternately to take the products, that is, where three products wide are coming down, the folding cylinder 18 takes the three products and the succeeding three products are taken by the cylinder 19, the cylinders 18, 19 being provided with suitable sheet taking devices for taking the sheets, such as grippers. For the purpose hereinafter referred to, each of the cylinders are provided with two sets of grippers, the cylinder 18 being provided with grippers 181 and 182 and tucking blades 183 and 184, and the cylinder 19 being provided with grippers 191 and 192, and tucking blades 193 and 194. From the cylinders 18, 19 the products pass to co-operating folding cylinders

which are shown as jaw cylinders 20, 21, 22 and 23, these cylinders being provided with jaws 201, 210, 220 and 230.

In order to provide for the delivery of a large number of different signatures, two deliveries are provided on each side of the folding mechanism arranged in superposed relation and these deliveries are each, as shown in figure 1, a plurality of products wide. Thus from the cylinder 18 three products are delivered to the jaw cylinder 20 from which the products are delivered through pressure rolls 24 to three deliveries arranged abreast and marked 25, 26 and 27. The second set of products is delivered from the cylinder 19 to the jaw cylinder 22 and from it are passed through similar pressure rolls 240, to a plurality of delivery trays arranged abreast and marked 31, 32 and 33. The third set of products is then taken by the cylinder 18 and is delivered to the jaw cylinder 21, and passes through pressure rolls 241 to delivery trays 28, 29 and 30 arranged below the delivery trays 25, 26 and 27, before referred to, and as shown in figure 1. The fourth set of products is delivered from the cylinder 19 to the jaw cylinder 23 and from this cylinder passes through pressure rolls 242 to a plurality of side by side delivery trays 34, 35 and 36, these trays being located below the trays 31, 32 and 33, before referred to.

It will thus be seen that, with the construction so far described, without adding a large number of new parts or complicating the machine, a large number of products with a head fold can be simultaneously delivered, and with the arrangement shown, twelve differently printed signatures may be produced. It will be obvious, of course, that various associations of the sections of the web can be made by varying the arrangement of the turner bars 8 and thus produce signatures having various number of pages.

Referring to figure 4, a slightly different arrangement is shown. In this the wide web W is slit into only three webs *f*, *g*, *h*, which go directly to the three formers 37, 38 and 39 which, as in figure 2, are arranged diagonally of the press, the rest of the arrangement so far as the delivery is concerned being the same as that already described. With the construction shown in this figure twelve different signatures of eight pages each and having a head fold will be produced.

In the construction shown in figs. 5 & 6 the formers are arranged out of line widthwise only of the web, i.e. instead of being arranged diagonally, as has heretofore been described, they are

arranged one behind the other, these formers being marked 41, 42 and 43. Figure 6 shows diagrammatically the arrangement of turner bars for guiding the webs to these folders, the printed web being divided into six webs for delivery. In the particular construction shown here, the main web W goes over a drag roll 44 and is slit by slitters 45 and 46 into three webs 47, 48 and 49. The web 49 is again slit by a slit 50 co-operating with a drag roll 51 into two webs 52 and 53. The web 52 runs directly to the former 41 and the web 53 is given a turn and associated with web 52 by bars 54 and 54'. The web 48 is slit by a slit 55 co-operating with a drag roll 56 into two webs 57 and 58. The web 57 goes over bars 59 and 59', and the web 58 goes over bars 60 and 60', these webs being associated over a drag roll 61 and going to the former 42. The web 47 is divided into two webs 62 and 63. The web 62 goes over bars 64 and 64', and the web 63 over bars 65 and 65' these webs being associated with a drag roll 66 and going to the former 43.

It will be seen that with any of the arrangements described, each of the webs has a different length of path, i.e., the webs *c.d.* fig. 1 have an extended path compared with the webs *a.b.* while the webs *e.f.* have an extended path compared with the webs *c.d.*, the difference in the length of the web path being slightly more than the width of a product, thus enabling the webs to be run side by side from either side of the former to the side by side delivery trays so that a large number of different products may be accommodated without unduly complicating the mechanism.

While the invention has been shown and described in its preferred form, it will be understood that various arrangements of the formers and deliveries can be made within the scope of the invention, and that the invention is not, therefore to be restricted to the particular arrangement shown and described.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. In delivery mechanism for use in printing machines the combination of a plurality of formers over which a plurality of webs are led and arranged out of line with respect to each other widthwise and lengthwise of the web,

means for severing products from the webs, and a plurality of delivery devices each two or more products wide to which the products are delivered.

2. In a delivery mechanism for use in printing machines, the combination of a plurality of formers which are arranged out of line widthwise of the web and are directed in the same direction, means for severing products from the webs passing over said formers, and a plurality of delivery devices each two or more products wide to which the products are delivered.

3. A delivery mechanism as claimed in claim 1 or 2, in which the webs are forwarded in side by side relationship from the formers.

4. The combination with delivery mechanism as claimed in claim 1, 2 or 3 of means provided for dividing a wide web into a plurality of narrower webs.

5. The combination with the delivery mechanism claimed in any of the preceding claims of means for giving the products a cross fold.

6. A delivery mechanism as claimed in any of the preceding claims in which the delivery devices are located on each side of the formers.

7. A delivery mechanism as claimed in any of the preceding claims in which the products are alternately delivered to the delivery devices.

8. A delivery mechanism as claimed in claim 6 in which the delivery devices on each side are superposed.

9. Delivery mechanism as claimed in any of the claims 1 or 2 and 5 comprising a cutting mechanism capacitated to receive the webs in side by side relation for severing the products and a plurality of folding mechanisms by which the products are alternately taken and given a cross fold.

10. The combination with a delivery mechanism as claimed in any of the preceding claims of means for associating certain of the webs.

11. A delivery mechanism as claimed in claim 10 in which each folding mechanism comprises two folding cylinders to which products are alternately forwarded.

12. Delivery mechanism for use in printing machines substantially as described with reference to the accompanying drawings.

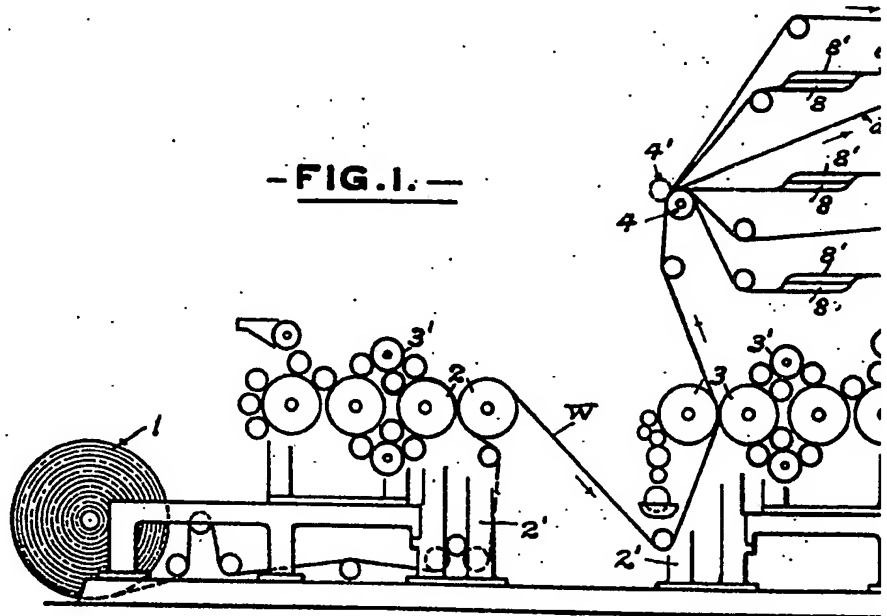
Dated this 31st day of December, 1928.

CARPMAELS & RANSFORD,

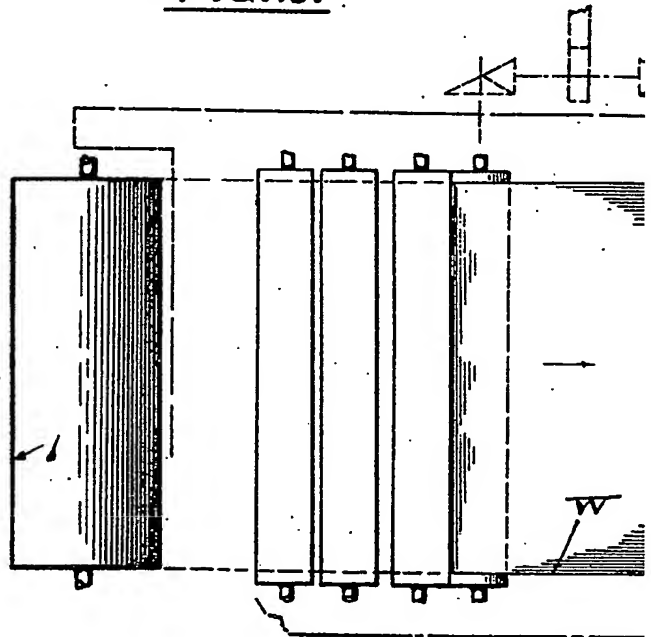
Agents for Applicants,

24, Southampton Buildings, London,
W.C. 2.

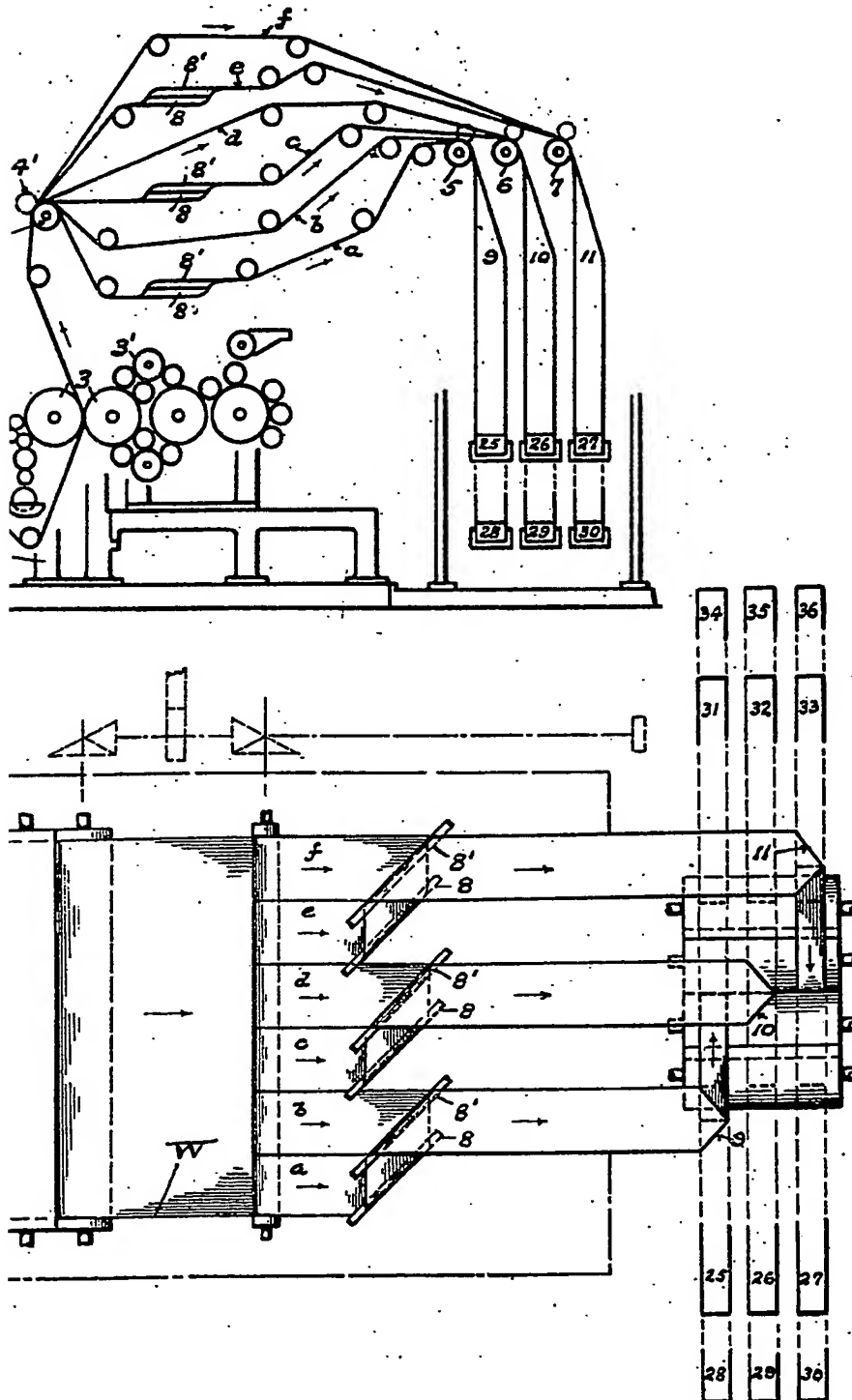
- FIG. 1. -

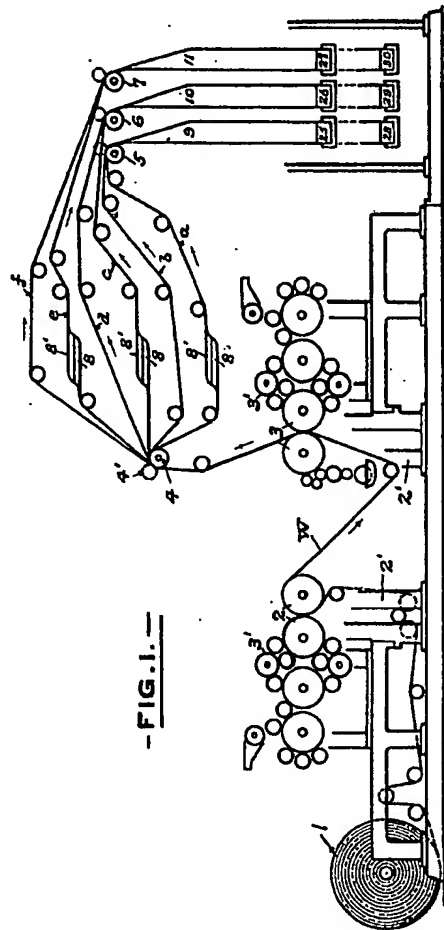


- FIG. 2. -

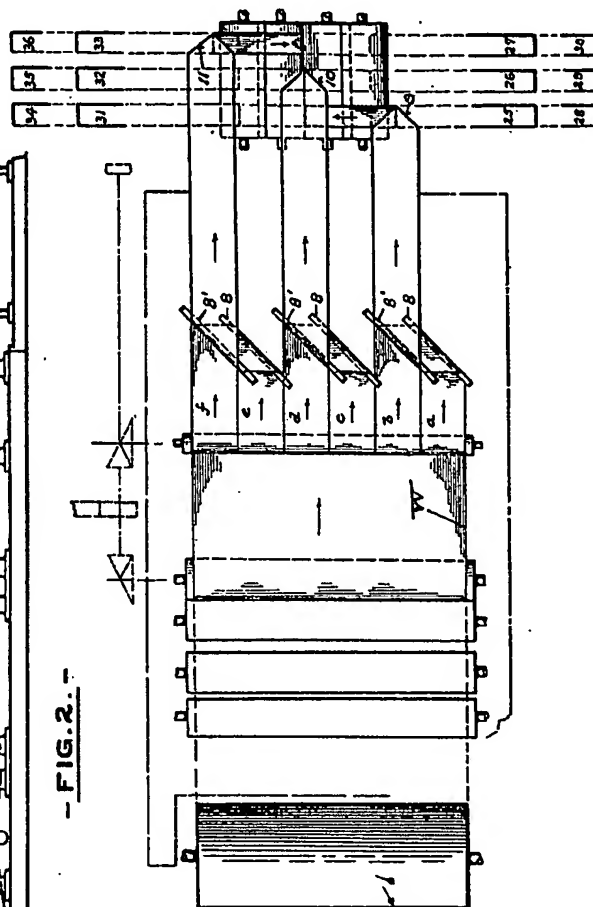


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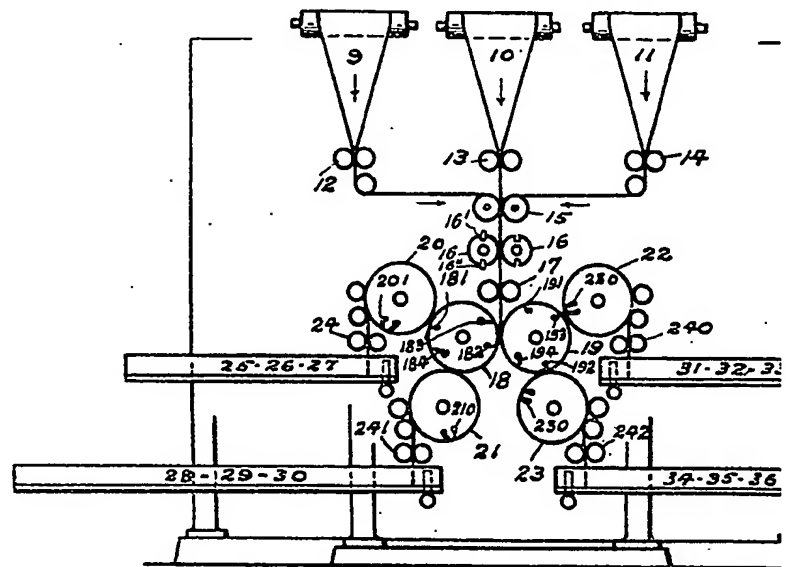


- FIG. 2. -

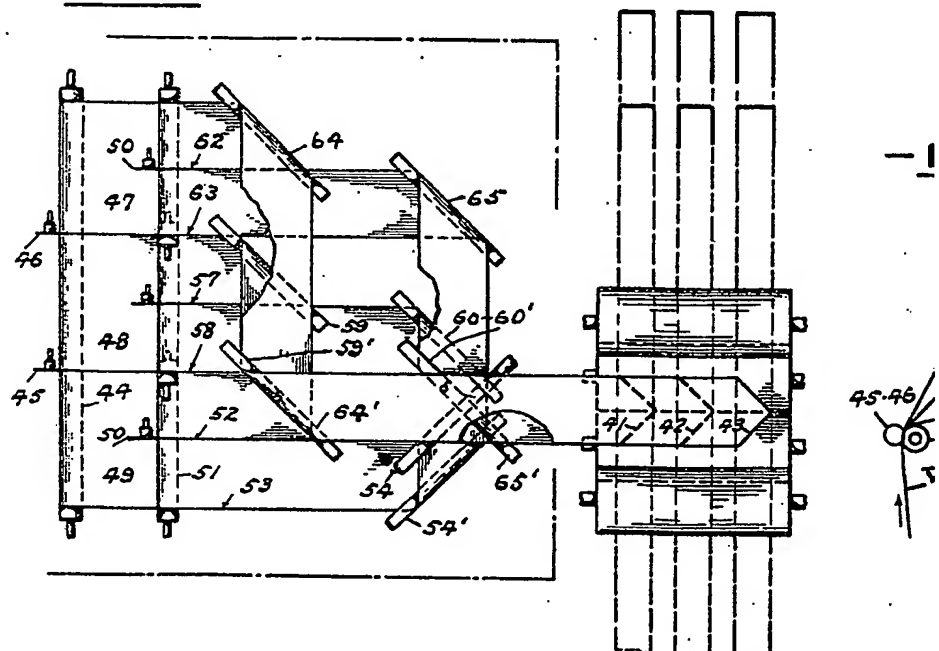


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-FIG. 3.-

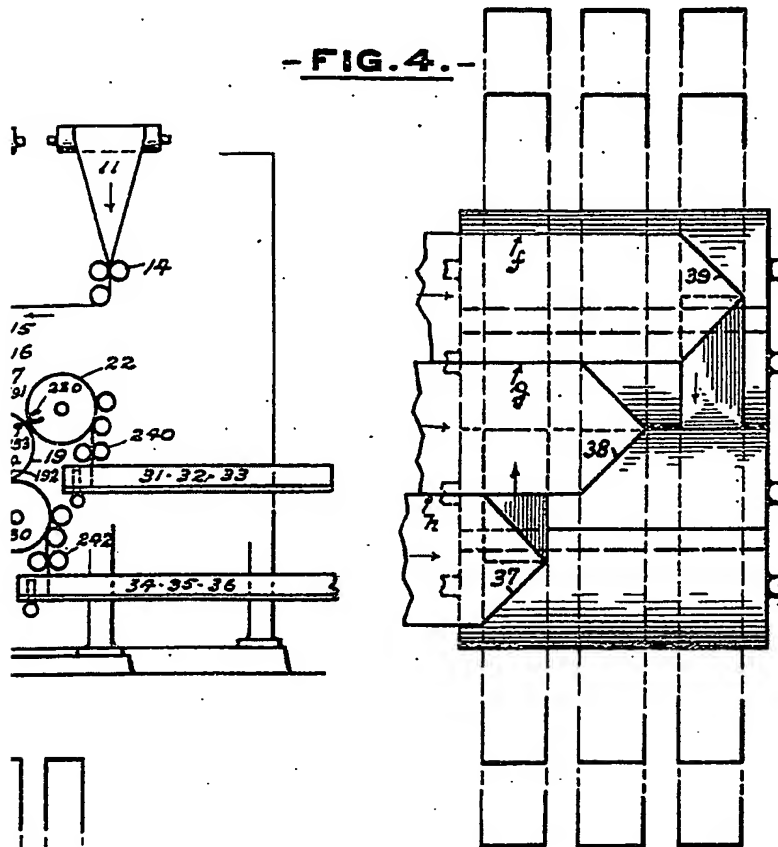


- FIG. 6. -

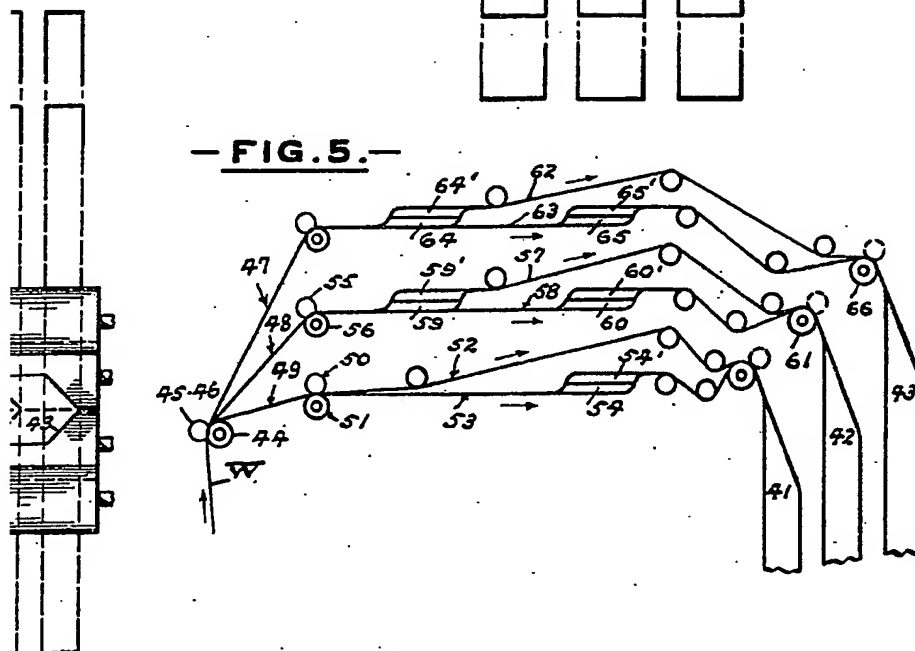


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- FIG. 4. -



- FIG. 5. -



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